

HIGH PERFORMANCE ACTIVE AND PASSIVE STRUCTURES BASED ON SILICON MATERIAL BONDED TO SILICON CARBIDE.

ABSTRACT OF THE DISCLOSURE

5 The present invention discloses and claims the Silicon Carbide based Silicon structure comprising: (1) a Silicon Carbide substrate, (2) a Silicon semiconductor material having a top surface, and either bonded to the Silicon Carbide substrate via the bonding layer, or epitaxially grown on the Silicon Carbide substrate; and (3) at least one separation plug formed in the Silicon semiconductor material. The single bonding layer, or either layer of the double bonding layer, is selected from the group consisting of : {a Silicon dioxide layer; a Silicon layer; a carbon layer; a Silicon germanium (SiGe) layer; a tungsten silicide layer; a titanium silicide layer; and a cobalt silicide layer}. The separation plug extends from the top surface of the Silicon semiconductor material into the Silicon Carbide substrate at a separation plug depth level, and is configured to block the coupling between at least two adjacent active/passive structures formed in the Silicon semiconductor material.

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